

CLAIMS:

1. What is claimed is a soluble trauma-healing hemostatic cellulose fiber characterized in that coagulation proteins are imparted to a natural or regenerated cellulose fibers that has been carboxymethylated to an extent so that the degree of substitution of the glucose units constituting the cellulose molecule is 0.5 - less than 1.0%.

2. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 1 herein above characterized in that the coagulation proteins consists of three types, being fibrinogen, thrombin, and coagulation factor XIII.

3. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 2 herein above characterized in that the coagulation proteins are imparted by surface application to the aforesaid carboxymethylated natural or regenerated cellulose fibers.

4. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 3 herein above characterized in that the coagulation proteins are applied by spraying a solution thereof.

Sub
Q6
5. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 3 or 4 herein above characterized in that the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, are imparted jointly in a single application.

6. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 3 or 4 herein above characterized in that the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII are imparted severally by way of consecutive applications.

7. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 2 herein above characterized in that the coagulation proteins are imparted by chemical bonding to the aforesaid carboxymethylated natural or regenerated cellulose fibers.

8. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 7 herein above characterized in that the coagulation proteins are chemically bonded by reacting them with the aforesaid carboxymethylated natural or regenerated cellulose fibers previously treated with carbodiimide.

Sub
Q2 9. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 7 or 8 herein above characterized in that the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, are chemically bonded jointly in a single pass.

10. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 7 or 8 herein above characterized in that the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, are chemically bonded severally in consecutive passes.

11. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 1 through to 10 herein above characterized in that the aforesaid natural or regenerated cellulose fibers are pulverized after imparting the coagulation proteins.

12. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 1 herein above characterized in that the aforesaid natural or regenerated cellulose fibers obtained by imparting the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, by individual surface applications are individually pulverized and mixed after imparting said coagulation proteins.

13. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 12 herein above characterized in that the coagulation proteins are applied by spraying a solution thereof.

14. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 12 herein above characterized in that the aforesaid natural or regenerated cellulose fibers obtained by imparting the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, obtained by individual chemical bonding are individually pulverized and mixed after imparting said coagulation proteins.

15. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claim 14 herein above characterized in that the coagulation proteins are chemically bonded by reacting them with the aforesaid carboxymethylated natural or regenerated cellulose fibers previously treated with a carbodiimide reagent.

16. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 1 through to 15 herein above characterized in that the aforesaid natural or regenerated cellulose fibers are drawn thread array consisting of a number of single threads loosely twisted together.

17. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 1 through to 15 herein above characterized in that the aforesaid natural or regenerated cellulose fibers are obtained by plain or twill weaving the drawn thread array consisting of a number of single threads loosely twisted together.

18. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 17 or 17 herein above characterized in that the drawn fiber arrays have a thickness of 20 - 100 Denier.

19. What is claimed is a soluble trauma-healing hemostatic cellulose fiber in accordance with any one of claims 1 through to 15 characterized in that said natural or regenerated cellulose fibers are a gauze-like material obtained by shoddy wool treatment.

20. What is claimed is a method of producing a soluble trauma-healing hemostatic cellulose fiber characterized in that after treatment of the natural or regenerated cellulose fiber with an aqueous sodium hydroxide solution, this is caused to react with a monochloro acetic acid solution for carboxymethylation to such an extent that the degree of substitution of the hydroxyl groups of the glucose units constituting the cellulose molecule (etherification degree) is 0.5 to less than 1.0%, with subsequent refining and imparting of said coagulation proteins by spray application of a solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, with subsequent drying.

21. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with claim 20 herein above characterized in that said solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, is spray-applied jointly in a single pass.

22. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with claim 20 herein above characterized in that said solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, is spray-applied severally in separate consecutive passes.

23. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber characterized in that after treatment of the natural or regenerated cellulose fiber with an aqueous sodium hydroxide solution, this is caused to react with a monochloro acetic acid solution for

carboxymethylation to such an extent that the degree of substitution of the hydroxyl groups of the glucose units constituting the cellulose molecule (etherification degree) is 0.5 to less than 1.0%, with subsequent refining and, after treatment with a carbodiimide agent, imparting of said coagulation proteins by chemical bonding of a solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, with subsequent drying.

24. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with claim 23 herein above characterized in that the treatment with said solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, is carried out jointly in a single pass.

25. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with claim 23 herein above characterized in that the treatment with said solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, is carried out severally in separate consecutive passes.

54
04
26. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with any one of claims 20 through to 25 herein above characterized in that after imparting the coagulation proteins and after subsequent drying, the aforesaid natural or regenerated cellulose fiber is pulverized.

27. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with claim 20 herein above characterized in that said solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, is spray-applied severally in separate consecutive passes, and that after imparting said coagulation proteins and after subsequent drying,

the aforesaid natural or regenerated cellulose fibers are pulverized and mixed.

28. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with claim 23 herein above characterized in that said solution of the three types of coagulation protein, being fibrinogen, thrombin, and coagulation factor XIII, is used for chemical bonding severally and individually, and that after imparting said coagulation proteins and after subsequent drying, the aforesaid natural or regenerated cellulose fibers are pulverized and mixed.

29. What is claimed is a method of producing the aforementioned soluble trauma-healing hemostatic cellulose fiber in accordance with any one of claims 20 through to 28 herein above characterized in that the reaction with monochloro acetic acid is conducted for 4 - 18 hours.

30. What is claimed is method of producing a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 20 through to 29 herein above characterized in that the aforesaid natural or regenerated cellulose fibers are drawn thread array consisting of a number of single threads loosely twisted together.

31. What is claimed is method of producing a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 20 through to 29 herein above characterized in that the aforesaid natural or regenerated cellulose fibers are obtained by plain or twill weaving the drawn thread array consisting of a number of single threads loosely twisted together.

32. What is claimed is method of producing a soluble trauma-healing hemostatic cellulose fiber in accordance with claims 30 through to 31 herein above characterized in that the drawn fiber arrays have a thickness of 20 - 100 Denier.

33. What is claimed is method of producing a soluble trauma-healing hemostatic cellulose fiber in accordance with any one of claims 20 through to 29 herein above characterized in that said natural or regenerated cellulose fibers are a gauze-like material obtained by shoddy wool treatment.

Add
B1

10069561-102201